INTERMOUNTAIN STATION
Central Reference File
No. 4.25

APPLIED FORESTRY NOTES

NORTHERN ROCKY MOUNTAIN
FOREST AND RANGE EXPERIMENT STATION
AND
COOPERATING AGENCIES *

No. 63 April, 1934 Missoula, Montana

BREAKAGE LOSSES AND CULL PER CENT OF TIMBER IN THE INLAND EMPIRE

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The Northern Rocky Mountain Forest and Range Experiment Station recently completed an investigation of breakage losses in felling the most important timber species of this Region. Information on cull per cent was also obtained incidental to the breakage data. The results of this study are presented as briefly as possible without comment on the reasons for the various conclusions.

In computing the breakage and cull percentages for western white and ponderosa pine, the gross volume of trees from the stump to the small end of the top log removed from the woods was used as 100%. In the case of western larch and Rocky Mountain Douglas fir, the gross volume from the stump to a top diameter of eight inches was used as 100%.

BREAKAGE LOSSES

WESTERN (IDAHO) WHITE & PONDEROSA PINE

Per Cent Deduction for Breakage in Felling

Character of Ground (1)		Western (Idaho) White Pine		Ponderosa Pine	
Topography	Surface of Ground	A	B	A	B
Even	Normal	.8	.4	.8	.1
"	Windfall	1.1	.4		
Moderately Broken	Normal	2.4	1.0	1.7	.6
" "	Rocky			1.6	1.0
" "	Windfall	3.6	1.4		
Badly Broken	Normal	7.5	5.5	4.4	1.4
" "	Rocky			4.0	1.2
" "	Windfall	6.3	3.0		
Average of All Classes of Ground and Size of Timber		3.0	1.3	2.0	.6

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(1) Each class of ground under this heading contains variations in slope from level to slopes in excess of 50%.

A = per cent loss from breakage if volume table being used is based on volume of trees from stump cut to an arbitrary top diameter inside bark of 6 inches, whenever practicable to take measurements to this top diameter.

B = per cent loss from breakage if volume table being used is based on actual volume of tree from stump cut to the small end of the top log removed from the woods.

LARCH & DOUGLAS FIR

Logging operations in the larch-Douglas fir type were not very extensive at the time of the study. Timber being logged at that time suffered a loss of 4% for frozen larch and 3% for unfrozen larch. The loss in felling Douglas fir in the larch-Douglas fir type is negligible.

DEDUCTION FOR CULL

WESTERN (IDAHO) WHITE PINE

Cull per cent for this species exclusive of breakage averaged 15%. This figure should be used only as a guide in deducting for cull, or for calculations involving large localities within the western white pine type. The cull per cent (exclusive of breakage) applicable to a given stand is probably best applied on an age-class basis as follows:

80 to 100 years	101 to 120 years	121 to 140 years	141 to 160 years	161 to 180 years	181 to 200 years	201 to 300 years	301+ years
3%	6%	10%	12%	16%	18%	20%	24%

PONDEROSA PINE

Less than 200 years old	200 to 300 years old	300 years old and older
2%	4%	5%

If the volume tables used for cruising are based upon gross volume of trees to an arbitrary top diameter of 6 inches, the volumes obtained should be reduced one and three per cent respectively for western white and ponderosa pine before applying the preceding cull and breakage figures.

LARCH-DOUGLAS FIR

Defect in larch averaged 13% when the gross tree volumes were computed on the basis of the volume actually utilized, and 15% when the gross tree volumes were computed to a fixed top diameter of 8 inches. Thus, in the field application of these data, larch volumes obtained by cruising trees to a fixed top diameter of 8 inches should be reduced by 15% for defect

plus an additional 4% for breakage, or a total of 19%. A similar figure for Douglas fir is 8%.

The preceding cull and breakage percentage figures are only indicative of these losses in average stands. Consequently, in field application they may be either raised or lowered in accordance with the cruiser's judgment of the deviation of the stand, being cruised, from the average.